ISBN 1188–4169

Canada Communicable Disease Report

FAX

Vol . 24–1

Date of publication: 1 January 1998

Contained in this FAX issue: *(No. of pages: 5)*

HOSPITALIZATIONS FOR PELVIC INFLAMMATORY DISEASE IN CANADA, 1983/84-1993/94	F-1	1-5
CHLAMYDIA TRACHOMATIS GENITAL INFECTIONS — UNITED STATES, 1995	F-4	5-8

Official page numbers:

For reference purposes, citing should refer to the page numbers of the printed copy and not to those of the FAX copy (F-#).

HOSPITALIZATIONS FOR PELVIC INFLAMMATORY DISEASE IN CANADA, 1983/84-1993/94

Introduction

Pelvic inflammatory disease (PID) is "an inflammation of the endometrium, fallopian tubes, pelvic peritoneum and/or contiguous structures"[1]. The inflammation is caused by an infection of the genital tract which spreads upwardly from the vagina and endocervix to the upper reproductive tract. Approximately 75% to 85% of PID is caused by *Neisseria gonorrhoeae* and *Chlamydia trachomatis*[1-3]. It has been estimated that gonococcal infection is involved in 25% to 50% of PID cases and chlamydial infection in 30% to 60%[1].

The consequences of both symptomatic and asymptomatic ('silent') PID can be long-term and severe. The inflammatory process causes scarring of the fallopian tubes resulting in tubal infertility, ectopic pregnancy, and chronic pelvic pain. Asymptomatic PID likely remains undiagnosed and therefore untreated until the emergence of one or more sequelae; it has been estimated to occur three to five times more frequently than clinically diagnosed cases[4]. After one episode of PID, approximately 15% of women become sterile; this rate doubles after a second infection[5].

The Canadian annual direct and indirect costs have been estimated as high as $13 million for gonococcal PID and as high as $21.1 million for chlamydial PID[6]. These burden-of-illness estimates are for hospitalized cases only; there are no reliable estimates of ambulatory cases.

The symptoms of PID syndrome range from none to severe. Symptoms can include lower abdominal pain, urethritis or inflammation of the visceral peritoneum of the bladder, dysuria and urinary frequency, purulent endocervical discharge, and fever. Diagnosis of PID presents a major clinical challenge to most physicians; fewer than 16% of women with PID fit the textbook case definition[7]. In one study the positive predictive value of a clinical diagnosis of PID was 0.65 — only slightly better than chance[8]. In addition, PID can often be confused with other syndromes which leaves open the possibility for over-diagnosis (i.e. a false-positive diagnosis adds to the number of true cases). Laboratory results are prone to false-negative and false-positive reports. Direct visualization of the upper genital tract requires an invasive surgical procedure (laparoscopy); it is not recommended as a diagnostic procedure. Even when laparoscopy is used, its sensitivity is less than ideal. A study in Burlington, Ontario found 50% sensitivity with laparoscopy — no better than chance[9].

PID is not a notifiable disease in Canada. Hospital separation data are the most reliable source of information on its incidence. Statistics Canada has published hospital morbidity data on the number of hospitalizations by province and by selected age groups for the fiscal years (31 March to 1 April of the following year) of 1983/84 to 1993/94. The Canadian Diagnostic Short Code 137, which corresponds to ICD-9 Code 614, was used and is defined as "inflammatory diseases of ovary, fallopian tube, and pelvic peritoneum"[10]. The number of PID hospitalizations reflect the number of hospital discharges; accordingly, the database may include more than one admission for the same patient in one year. Incidence rates have been calculated per 100,000 female population by selected age groups using population data from Statistics Canada (Table 1).

Results

Between 1983/84 and 1993/94, 2.3% of all Canadian women of reproductive age (15 to 44 years of age) experienced PID of sufficient severity to be hospitalized. In this 11-year period, there was a decrease in total hospitalizations of 8,950 (51.1%). The rate of hospitalizations ranged from 386.0 per 100,000 in 1983/84 to 141.7 per 100,000 in 1993/94, representing a decrease of 64% (Figure 1). The 20- to 24-year-old group had the highest mean rate over that time period: 179.8 hospitalizations per 100,000. Second highest rates were in the 25- to 34-year-old age group, ranging from 323.1 per 100,000 in 1983/84 to 147.9 per 100,000 in 1993/94 (decrease of 54%). The 15- to 19-year-old group showed a decrease of 59%.

Health Canada Santé Canada

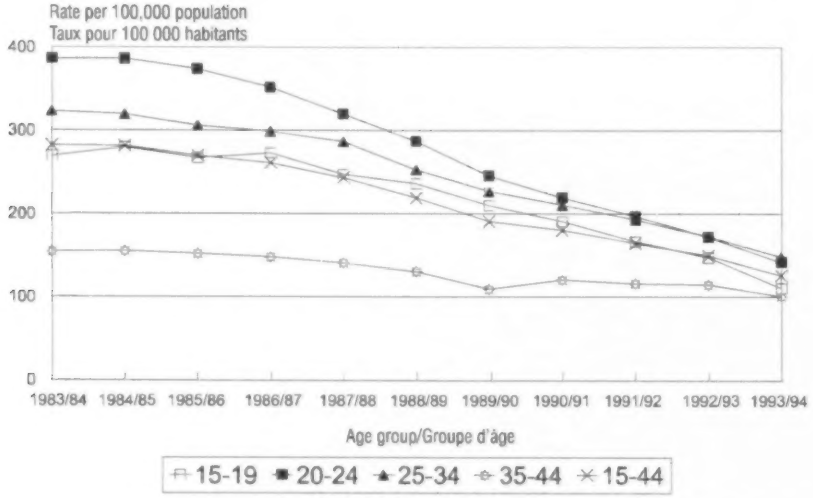
Canada

Table 1
Cases and rates* of hospital separations for PID, by age, Canada, 1983/84 to 1993/94

Year**	Age group (years)									
	15-19		20-24		25-34		35-44		Total 15-44	
	No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate
1983/84	2,891	269.6	4,802	386.0	7,269	323.1	2,552	154.7	17,514	281.8
1984/85	2,868	280.2	4,797	385.9	7,320	319.5	2,664	155.0	17,649	281.2
1985/86	2,634	267.2	4,607	373.4	7,143	306.0	2,711	151.9	17,095	269.7
1986/87	2,650	273.1	4,243	351.5	7,101	298.5	2,735	147.8	16,729	261.1
1987/88	2,368	247.2	3,723	319.7	6,951	286.3	2,710	140.9	15,752	243.3
1988/89	2,249	236.2	3,197	286.8	6,246	252.7	2,604	130.4	14,296	218.7
1989/90	1,993	210.0	2,660	245.3	5,721	226.6	2,275	109.2	13,682	190.5
1990/91	1,803	190.5	2,309	219.3	5,359	210.5	2,609	120.4	12,090	180.0
1991/92	1,567	166.5	2,046	196.4	4,881	192.7	1,591	116.0	11,085	164.3
1992/93	1,387	147.0	1,778	171.6	4,343	172.1	2,616	114.5	10,124	149.2
1993/94	1,046	110.1	1,459	141.7	3,700	147.9	2,359	100.7	8,564	125.5

* Rates per 100,000 female population.
** Since 1980, Statistics Canada has reported all hospital morbidity by fiscal year.

Figure 1
Hospitalizations for PID, Canada, 1983/84-1993/94



Discussion

The decline in the incidence of PID hospitalizations represents a change in the findings for the previous decade. Hospital discharge data from the same source for the period 1971 to 1980 indicated an increase over time in all age groups with the largest increase (51%) in the 15- to 19-year-old age group, followed by the 20- to 24-year-old age group (35%)[11].

Decreases in PID hospitalizations in the latter part of the 1980s and onward also have been noted in Holland, Sweden, and the United States with differential decreases occurring in specific age groups[12-14]. The downward trend of the incidence of PID hospitalizations may, in part, reflect concomitant decreases in the incidence of gonorrhea and chlamydial infections — declines as a result of the emerging awareness of the AIDS epidemic in the early 1980s and the augmented use of safer sex practices. However, caution should be exercised in interpreting the reasons for the decreases.

An American study attributed the decline in the incidence of PID hospitalizations to changes in practice patterns away from hospitalization to a preference for ambulatory care[13]. This trend was noted for all conditions. It has been estimated that only 10% to 15% of all PID cases in Canada are treated in hospitals[15]. Outpatient visits for PID in the province of Manitoba decreased from 695 to 463 (33%), while hospitalizations decreased from 139 to 71 (48%) over a 10-year period from 1981 to 1990. However, annual rates of hospitalization for any condition, including infectious diseases, remained relatively constant over the same period[16].

Furthermore, research findings have indicated that the incidence of chlamydial PID, which is less severe than gonococcal PID, is increasing in relation to the incidence of the latter. Accordingly, the hospitalized cases of PID may reflect the more severe cases due to gonorrhea. An estimate of the true incidence of PID is compounded by the asymptomatic nature of chlamydial infection (70% of cases are asymptomatic). More important, if asymptomatic cases remain undetected and therefore undiagnosed, the reservoir of infection causing PID becomes endemic in the community. Women with subacute or asymptomatic infections may never know that they have been infected with *Chlamydia* until they decide to have a child, at which time they discover that they have tubal infertility and cannot conceive, or they become pregnant but the pregnancy is ectopic. In essence, although the rates for hospitalization are showing a positive downward trend, hospitalization data represent the "tip of the iceberg." The true incidence of PID remains elusive and is subject to varying interpretations.

Prevention of genital-tract infection with *Chlamydia* and *N. gonorrhoeae* remains the best strategy for the prevention of PID and, subsequently, its long-term sequelae.

References

1. LCDC. *1995 update: Canadian STD guidelines.* CCDR 1995;21S4:25-33.
2. Weström L. *Incidence, prevalence and trends of acute pelvic inflammatory disease and its consequences in industrialized countries.* Am J Obstet Gynecol 1980;138:880-92.
3. Weström L. *Current views on the concept of pelvic inflammatory disease.* Aust Z J Obstet Gynaecol 1984;24:98-105.
4. Wolner-Hanssen PW, Kiviat NB, Holmes KK. *Atypical pelvic inflammatory disease: subacute, chronic, or subclinical upper genital tract infection in women.* In: Holmes KK, Mardh PA, Sparling PF et al, eds. *Sexually transmitted diseases.* 2nd ed. New York: McGraw-Hill, 1990:615-20.
5. Adebayo A. *Pelvic inflammatory disease: an unpublicized public health problem in Alberta.* Can J Public Health 1989;80:447-49.
6. Gully P, Goeree R. *The burden of chlamydial and gonococcal infection in Canada.* In: *Prevention of infertility, research studies of the Royal Commission on New Reproductive Technologies.* Vol. 8. Ottawa, ON: Minister of Supply and Services Canada, 1993:29-76.
7. Canadian PID Society. *Submission to the Royal Commission on Health Care and Costs from the Canadian PID (Pelvic Inflammatory Disease) Society.* Vancouver, BC: Canadian PID Society, 1990.
8. Jacobson L, Weström L. *Objectivised diagnosis of acute pelvic inflammatory disease, 1969.* Am J Obstet Gynecol 1969;105:1088.
9. Sellors J, Mahony J, Goldsmith C et al. *The accuracy of clinical findings and laparoscopy in pelvic inflammatory disease.* Am J Obstet Gynecol 1991;164:113-20.
10. Statistics Canada. *Hospital morbidity.* Ottawa, ON: Statistics Canada, 1983/84 to 1987/88. Cat. No. 82-206.
11. Jessamine AG, Todd MJ. *Trends in hospitalization for pelvic inflammatory disease, Canada, 1971-1980.* Presented at the International Conjoint STD Meeting, Montreal, 1984. LCDC, Health Canada.
12. Coutinho RA, Rijsdijk AJ, van den Hoek JAR et al. *Decreasing incidence of PID in Amsterdam.* Genitourin Med 1992;68:253-55.
13. Rolfs RT, Galaid EI, Zaidi AA. *Pelvic inflammatory disease: trends in hospitalizations and office visits, 1979 through 1988.* Am J Obstet Gynecol 1992;166:983-90.
14. Weström L. *Decrease in incidence of women treated in hospital for acute salpingitis in Sweden.* Genitourin Med 1988; 64:59-63.
15. Todd MJ. *Trends in hospitalization for pelvic inflammatory disease in Canada, 1971-1981.* Can Med Assoc J 1986;134:1157-58.
16. Orr P, Sherman E, Blanchard J et al. *Epidemiology of infection due to* ***Chlamydia trachomatis*** *in Manitoba, Canada.* Clin Infect Dis 1994;19:876-83.

Source: *R Kurtz, BA, J Doherty, BA (Hon), MSc, Division of STD Prevention and Control, Bureau of HIV/AIDS and STD, LCDC, Ottawa, ON.*

CHLAMYDIA TRACHOMATIS GENITAL INFECTIONS — UNITED STATES, 1995

In 1995, all states (except Alaska) and the District of Columbia reported cases of chlamydial infection to the United States Centers for Disease Control and Prevention (CDC). Sixteen states (Hawaii, Idaho, Mississippi, Missouri, Nebraska, Nevada, New Hampshire, New Jersey, Oklahoma, South Dakota, Tennessee, Utah, Virginia, Washington, Wisconsin, and Wyoming) provided anonymous line-listed data to CDC for 70,101 cases of chlamydial infection among women, including 68,344 with age data. *Chlamydia* screening and prevalence-monitoring activities were initiated in Public Health Service (PHS) Region X in 1988 as a CDC-supported demonstration project. In 1993, *Chlamydia* screening services for women were initiated in three additional PHS regions (III, VII, and VIII) and, in 1995, in the remaining PHS regions (I, II, IV, V, VI, and IX)*. In some regions, federally funded *Chlamydia* screening supplements local- and state-funded screening programs. Data about trends in *Chlamydia* test positivity (number of positive tests divided by number of adequate tests performed) were available for Region X (approximately 70,000 tests per year) for 1988 to 1995, and for Region III (approximately 100,000 tests per year), and Region VIII (approximately 50,000 tests per year) for 1994 to June 1996.

In 1995, a total of 477,638 cases of chlamydial infection were reported to CDC, representing a rate of 182.2 cases per 100,000 population. State-specific rates for women ranged from 46.4 to 622.0 per 100,000; rates were highest in western and midwestern states**. The overall reported rate for women (290.3) was nearly six times higher than that for men (52.1). Of the 68,344 cases in women for whom age data were available, 2,452 (4%) were aged ≤ 14 years; 31,511 (46%) were aged 15 to 19 years; 22,540 (33%) were aged 20 to 24 years; and 11,841 (17%), were aged ≥ 25 years.

In 1995, state-specified *Chlamydia* test positivity among women aged 15 to 24 years who were screened at selected family-planning clinics ranged from 2.8% to 9.4%. During 1988 to 1995, among women participating in the screening programs in Region X Chlamydia Project family-planning clinics, the annual rate of *Chlamydia* test positivity declined 65% (from 9.3% to 3.3%). Rates declined substantially for all age groups, although they were persistently highest among adolescents (Figure 1). Preliminary data from the Region III Chlamydia Project indicate that from 1994 to January to June 1996, the annual positivity rate among women aged ≤ 19 years declined 31% (from 7.8% to 5.4%). During this period, the annual positivity rate among women aged ≤ 19 years declined 16% (from 5.5% to 4.6%) in the Region VIII Chlamydia Project.

MMWR Editorial Note

In the United States, chlamydial infection is the most common infectious disease notification to state health departments and CDC[1]. During 1987 to 1995, the annual reported rate of chlamydial infections increased 281% (from 47.8 to 182.2 cases per 100,000), while the number of states that require reporting of this infection increased from 22 to 48. The findings in this report document the sustained high rates of chlamydial infections among American women through 1995. Reported case rates primarily reflect chlamydial infections identified during screening of asymptomatic women. Screening is an essential component of *Chlamydia* surveillance because, even though infection can cause extensive inflammation and scarring of the genital tract, most infected women have only mild manifestations or are asymptomatic. In states with low rates of screening and treatment, many chlamydial infections may not be identified or treated; consequently, state-specific rates of chlamydial infection may be low even though actual morbidity is high[2].

The low reported rate of chlamydial infection among men reflects low rates of testing among this group; most men with cases of chlamydial urethritis are treated for presumptive infection without confirmatory microbiologic testing, often as the result of a Gram-stain diagnosis of non-gonococcal urethritis. Increased use of *Chlamydia* testing among men would facilitate partner notification, evaluation, treatment, and reporting. In addition, approximately one-half of men with chlamydial infection may be asymptomatic, and screening for *Chlamydia* is limited among men, including those at high risk for infection.

Although notifiable disease surveillance data are an important indicator of morbidity, *Chlamydia* positivity rates among women attending family-planning clinics provide a more accurate measure of disease burden in this population. Based on analysis of data from universally tested clinic populations, comparisons of positivity rates (which may include more than one test for some patients) with prevalence rates (which are based on a single test per patient) indicate that positivity rates frequently underestimate prevalence, but generally by ≤ 10% (e.g., a positivity rate of 10% may correspond to a prevalence of 11%) (CDC, unpublished data, 1996). Positivity rates can be a useful indicator when prevalence data are not available. Declining positivity rates documented by the regional *Chlamydia* screening projects confirm the effectiveness of screening and treatment of women in reducing the prevalence of infection.

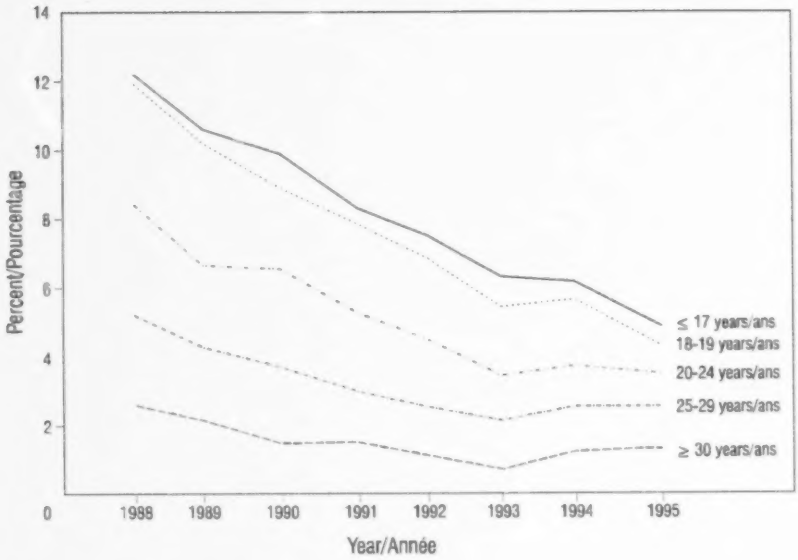
Both the case reports and the positivity data from family-planning clinics emphasize the continuing high burden of chlamydial disease in adolescent and young adult women. Data

---

* Region I = Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, and Vermont; Region II = New Jersey, New York, Puerto Rico, and United States Virgin Islands; Region III = Delaware, District of Columbia, Maryland, Pennsylvania, Virginia, and West Virginia; Region IV = Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, and Tennessee; Region V = Illinois, Indiana, Michigan, Minnesota, Ohio, and Wisconsin; Region VI = Arkansas, Louisiana, New Mexico, Oklahoma, and Texas; Region VII = Iowa, Kansas, Missouri, and Nebraska; Region VIII = Colorado, Montana, North Dakota, South Dakota, Utah, and Wyoming; Region IX = Arizona, California, Hawaii, and Nevada; and Region X = Alaska, Idaho, Oregon, and Washington.

** Northeast = Connecticut, Maine, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, and Vermont; Midwest = Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, North Dakota, Ohio, South Dakota, and Wisconsin; South = Alabama, Arkansas, Delaware, District of Columbia, Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia, and West Virginia; and West = Alaska, Arizona, California, Colorado, Hawaii, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, and Wyoming.

Figure 1
Percentage of *Chlamydia* test positivity† among women tested in family-planning clinics††, by age group and year — Region X Chlamydia Project †††, 1988-1995



† Number of positive tests divided by number of adequate tests performed.

†† Women who met screening criteria were tested.

††† Alaska, Idaho, Oregon, and Washington.

provided to CDC by the United States Department of Labor also documented high prevalences of infection among young women: in 1995, state-specific prevalence of infection among 16- to 24-year-old female entrants into the United States Job Corps (an economically disadvantaged population) ranged from 4.2% to 17.1%[3].

References

1. CDC. *Ten leading nationally notifiable infectious diseases — United States, 1995.* MMWR 1996;45:883-84.
2. Belongia EA, Moore SJ, Steece RS et al. *Factors associated with the geographic variation of reported* ***Chlamydia*** *infection in Minnesota.* Sex Transm Dis 1994;21:70-5.
3. CDC. *1995 Sexually transmitted disease surveillance.* Atlanta, Georgia: US Department of Health and Human Services, Public Health Service, 1996.

Source: *Morbidity and Mortality Weekly Report, Vol 46, No 9, 1997.*

Our mission is
to help the people of Canada
maintain and improve their health.

Health Canada

The Canada Communicable Disease Report (CCDR) presents current information on infectious and other diseases for surveillance purposes and is available through subscription. Many of the articles contain preliminary information and further confirmation may be obtained from the sources quoted. Health Canada does not assume responsibility for accuracy or authenticity. Contributions are welcome (in the official language of your choice) from anyone working in the health field and will not preclude publication elsewhere.

Scientific Advisors	Dr. John Spika	(613) 957-4243
	Dr. Fraser Ashton	(613) 957-1329
Editor-in-Chief	Eleanor Paulson	(613) 957-1788
Assistant Editor	Nicole Beaudoin	(613) 957-0841
Desktop Publishing	Joanne Regnier	

Submissions to the CCDR should be sent to the Editor-in-Chief, Laboratory Centre for Disease Control, Tunney's Pasture, Address Locator 0602C2, Ottawa, Ontario K1A 0L2.

To subscribe to this publication, please contact:
Member Service Centre
Canadian Medical Association
1867 Alta Vista Drive
Ottawa, Canada K1G 3Y6
Tel. No.: (613) 731-8610, ext. 2307
FAX: (613) 731-9102

Price per year:
Base subscription : $80.00 (plus applicable taxes) in Canada; $105 (U.S.) outside Canada.
Premium subscription : $150.00 (plus applicable taxes) in Canada; $175 (U.S.) outside Canada.

© Minister of Health 1997

This publication can also be accessed electronically via Internet using a Web browser at http://www.hc-sc.gc.ca/hpb/lcdc